ITEMS OF INTEREST.

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Shots from the Profession.

THE "AMERICAN SYSTEM"—PROSTHETIC DENTISTRY.

DR. L. P. HASKELL.

Professor Prosthetic Dentistry, Chicago College Dental Surgery.

In continuing an examination of this work, I find two pages devoted to preparing a pattern and cutting a plate; and the reader is advised that lead or tin should not be used for this purpose, because some of it *might* get into the gold pan, but to use paper instead. Just as though the only suitable material for a perfect pattern should not be used, because the workman might be careless; and even if it should get there, it is easily removed; and if it were not removed no harm is done, for nothing but clean scraps should ever go into the plate; all else, filings, old backings and clasps, should be melted and refined separately (to be used for clasps and backings), the process for which will remove *all* base metals.

Yes, *Japan* tea-lead is the best of all materials for patterns, if one wishes accuracy; and as to spreading it again so as not to injure the shape, press it carefully between the thumb and forefinger. It is simply impossible to make an *accurate* pattern of paper.

MAKING THE PLATE.

After swaging, the oft re-iterated instruction is given to "*pickle* in sulphuric acid and water, to remove any particles of base metal which may have adhered to the plate." If any one will try the experiment of seeing how long it will take to remove base metal from the surface of a gold plate by sulphuric acid, hot or cold, he will be surprised. The fact is, a *lead acid dish* is the very best that can be made. I am using one that has been in constant use for six years, and is perfect yet. This being the case one can readily see the folly of relying on such a process.

Instead of which, after annealing, while it is hot, drop the plate into the acid; the surface cleaned, one can readily see any metal that

has adhered, and wipe it off. To prevent, in a great measure, its adherence, *oil the dies*. There is no need of annealing after *every* swaging. If it is a soft plate or platina, and a flat or easy case to swage, twice after the preliminary annealing, will suffice. If you have a gold plate with platina in it, as some suggest (but which should never be used), and a high arch, you would need to anneal constantly.

We are told to swage away from the work bench for fear some particles of die metal will get into the gold pan. It seems as if at every step the process of making a plate must be made as inconvenient as possible.

Among the other tools it appears a blacksmith's vice is needed to hold the counter-die in swaging! what next? A convenient arrangement, which has been described and illustrated in the journals, would be found by any dentist, after once using, such a convenience he would not wish to dispense with it; and that is a *movable swaging block* on castors, to keep under the bench, beside the gold-drawer. This does not find a place in the "latest and best," but we do find an illustration, occupying one-half page, of a *horn mallet!* and this, we are told, to hold in the right hand, because the left is holding the plate!

The minute directions for striking with the hammer are of no practical account, a rebound of the hammer having nothing to do with the fitting of the plate. The trial of the plate on the plaster cast before it is fully swaged is unnecessary; and the plate should never be trimmed until it is fully swaged.

Now follow about six pages on "vacuum chambers," useless appendages, but not a word to the novice on a plate without one.

Then we have about two pages on "remediable defects" found in swaged plates. Not being cognizant of any such from long use of Babbitt Metal, I fail to appreciate the remedies.

The swaging of a partial lower plate (more difficult than any other), is still more complicated by the instructions here given.

He says he "prefers to take a plaster impression in *sections*, so as to make a duplicate cast, as the cast is liable to be injured in the earlier stages of the work."

There is no necessity for injuring the cast at all, consequently no necessity for a duplicate cast, and therefore no need of taking an impression in sections. That much labor may just as well be saved. The advice "to carry the plate up over the necks of the teeth," should always be observed, but it is not necessary nor advisable to set the plate up into the crevices so closely as he directs; in fact it is better not to do it, because the alveolus under these plates will settle, and

this of course brings the whole structure lower, and the farther the plate is forced into these spaces the more the membrane is irritated; in rubber plates I file off these interspace prominences.

He describes the swaging and soldering of the "reinforcing piece." Well, as it is necessary to double the plate back of the teeth, it is a much easier method to swage in *two pieces* and then it is "reinforced." The patterns should each be cut to extend $\frac{1}{4}$ inch beyond the last tooth, be it cuspid or bicuspid.

We are told that it is better to use binding-wire, instead of wire clamps, because they are apt to *bend the plate*. Never having seen a plate bent by them, and I double many plates, and always solder a flat wire on the margin of platina plates, I can say the use of the clamps is far more simple and in no way objectionable. Suppose it did bend a doubled plate, there is no possible objection to swaging again, in fact it is better to do so.

But in the case of an undercut in a lower cast, or as he says where the "ridge leans in all around," he "saves time and labor by using wax and getting the best result we can, for the first die, making the second or finishing die with cores."

Why don't he make both dies with cores? Because the way he makes cores (saying that sand is as good as anything to mix with the plaster), his core is broken and spoiled the first time it is used. Had he learned that asbestos with its fiber holds the core together, he would have made two, three or more dies, with *one* core.

Of course it will not do to allow the counter to follow the die, in the undercut, as they could not be separated. To avoid this, pack a little sand into the undercut of the die before casting the counter. Swage as far as the counter will allow, then, with flat plate-burnisher, work the plate into the undercut, as the die is a perfect one. The gold, in these, should always be soft; 20 karat.

Having made hundreds of such plates, I can guarantee their fitting the cast; and if the plaster impression was good, the plate will fit the mouth, if made from two Babbitt Metal dies and but one counter.

CLASPS.

Eight pages are devoted to the subject of clasps. The whole could be condensed into two pages.

The fitting of clasps to the gum all around the tooth is unwise, because too much of the surface is thus enclosed. A straight piece of gold, seldom over $\frac{3}{16}$ inch wide, narrowed, and made thinner at the ends, when finishing, is all that is necessary. The *wire* clasps, so much used by English dentists, should be condemned, as they wear the tooth. The attachment of the clasp to the plate, in adjusting, is

easily accomplished by the use of wax of tooth-cards, holding the clasp sufficiently firm, the use of shellac being inconvenient in every way and unnecessary. It is necessary to invest only the end of the plate with the clasp, and plaster and pumice is preferable to sand. I invest, dry and solder in fifteen minutes.

An important point is overlooked in the necessity of having the plate extend a little beyond the point of attachment, making it more steady. And also the distance the clasp should be soldered; never more than $\frac{3}{16}$ of an inch, leaving to the clasp a free movement.

The *double* clasp is unnecessary and should be discarded. A clasp that passes three corners will hold sufficiently.

FITTING PLATES.

Much space is given to fitting plates. Some of the difficulties enumerated would be easily avoided by dispensing with "suction cavities," and simply raising the plate slightly over the hard palate its entire length, and also "*mutilating the cast*," by scraping slightly, according to the softness of the tissues, each side of the center, as seen in Dr. Kirk's article on the "Hygiene of Artificial Dentures." Then on placing the plate in the mouth, with the palatal surface wet, and *pumping* it with the finger, notice if air bubbles escape; if so, burnish a little closer on the cast.

The old stereotyped method of forming the outer edge of the plate almost straight around, is here advocated, and the remark is made p. 590: "It has been recommended to extend the upper plate quite high at this point [angles of the nose] with this object in view [restoring contour of the lip], but it is seldom it can be done to advantage in plate-work; in fact *I question its value in any but exceptional cases!*"

Has our author never realized that the extraction of the cuspid teeth affects, more than any other teeth, the shape of the mouth, because of the prominence, not only of the tooth but of the root and its covering? Consequently, in the artificial denture this defect should be remedied; it can be, and is readily overcome, so that the peculiar expression, universal with the common shaped plate, of an undue prominence under the nose and depression at the corners, is relieved and the natural expression restored.

He says "it can seldom be done to advantage in plate-work." That depends on what he means by *plate-work;* if it is a full set of *single gum* teeth soldered to the plate, I agree with him; but that method has long been considered obsolete, or ought to be, for various reasons,—difficulty of arranging the teeth properly, for appearance and articulation; lack of cleanliness; but not least of which is that

the contour of lip cannot be restored when it is used. This is probably what he means, and as a teacher, he ought not to present methods so imperfect and undesirable when there are others far preferable in all respects, and no more expensive.

To show that it *can* be done in plate-work, I have simply to state that for twenty-five years in my own practice, *every plate* I have made—continuous-gum, gold, rubber, or celluloid—has been constructed on this principle.

Furthermore, I affirm that in every case where the cuspids have been extracted a year or more, there is absolute necessity for making the gums *higher* and *fuller* over the cuspids, than on any other portion of the denture. Nor is there the slightest difficulty in doing it. Where it is not done, there is no difficulty to the practiced eye in recognizing an artificial denture even though the mouth be closed.

CEMENTS.

J. F. SANBORN, D.D.S., TABOR, IOWA.

[An essay read before the Iowa State Dental Society, at Cedar Rapids, May 3d, 1887.]

In the use of oxychloride of zinc or oxyphosphate of zinc for a cement filling, why do we use these ingredients instead of some others?

To answer this question we must study the relationship that the various classes of substances bear to each other, to give stability to the various compounds in nature.

Chemistry will teach us how the inorganic elements relate themselves to each other to produce the hard refractory rocks of the Azoic eon, when the foundations of the earth were laid, and the oceans had bounds set that they should not pass. While yet in the incandescent state, certain materials combined with oxygen to become the hard refractory substances so essential to ensure stability in the basement materials.

If any of these substances were in an unstable condition, they were made stable by union with oxygen before they entered into the combination.

Nearly all the metals are found in a combined state as ore, and the metals that constitute the alkaline bases, as potassium, sodium, and calcium, have a strong affinity for oxygen; the one so much so as to decompose water to procure it, and burns with a bright flame; and thus become stable oxides as potash and soda, before they become ingredients of rocks.

Calcium first unites with oxygen to become lime, which subsequently unites with carbonic di-oxide to become limestone.

From these facts we learn that our cement must become a stable compound by the base becoming thoroughly oxidized so as to be proof against the further action of oxygen.

For this reason we select the oxide of zinc, which has been first volatilized, and then oxidized, when it falls down as a fine white powder, unchangeable in the air, and insoluble in water or the fluids of the mouth.

The chemical symbols are ZnO. This powder is entirely unfit, as now constituted, for our purpose.

With what shall we combine it to make it suitable to our wants? Let us ask nature.

Limestone is composed of calcium oxide as a base, and an acid, Carbonic di-oxide, two oxidized compounds, the one an alkaline base and the other an acid; the first a solid, the other an acid fluid or gas.

The lime (CaO) is well calculated for a base, with strong affinities; the other, carbonic di-oxide, is the weakest of all the acids, and because weak is liable to change whenever it comes in contact with any other acid.

Calcined plaster of Paris is another cementing compound, composed of a sulphate of lime ($CaO, S.O_3$), in this we have the same lesson from nature; calcium first combines with oxygen to form lime, and then with sulphuric acid and water.

The sulphate of lime has a much stronger cementing power than the carbonate, because this acid is the strongest of all the acids, so that it does not yield to the action of other acids and become decomposed.

In the crystallizing process of all the cements, it becomes necessary that the ingredients should be reduced to a fluid or nearly fluid condition, to enable the atoms a free motion so as to readily form themselves into molecules according to their bonds, and magnetic polarity, positive to negative and negative to positive.

It seems in plaster of Paris, a too great a degree of heat will destroy the setting property of plaster, so that when used to encase teeth for soldering, on being heated to a degree sufficient to solder gold plate, it becomes "burnt plaster" and will not set a second time, because of the decomposition of the sulphuric acid of the plaster. The ordinary calcining of plaster consists in heating it to from 300 to 400 Fahr. which drives off the water of crystallization.

In the mixing with water for use we add two parts, one of which unites chemically with the plaster to form the water of crystallization, and the other is retained mechanically in the cast, and may be dried out by applying to it a gentle heat.

Calcined plaster of Paris is like all other cements, an acid united with an oxidized metal base ($CaO.SO_3$).

Zinc is very oxidizable in a volatilized state, and then becomes insoluble. This is one reason why it has been selected as the base for our cement.

We have learned from nature, therefore, that some acid compound must be selected to unite with the oxide to form the cement that shall subserve our demands.

If we use a weak acid our filling will be decomposed by the stronger acids to which it may be exposed; if we use a strong acid it will react on the tooth structure and destroy it.

Hydro-chloride of zinc has been used as the acid portion of the cement, but its escharotic character acts on the nerve fibrils of the tooth, even after it has been mixt with the oxide, and occasions pain, thus rendering it less desirable than the hydrated glacial phosphoric acid.

In the analysis of tooth structure the phosphoric is the principal acid (P_2O_5), and because of the harmony of the cement formed by the action of this acid on the zinc oxide it has been selected as the best for our use, $ZnO.P_2O_5.H_2O$. In these ingredients we have insolubility in the zinc oxide (ZnO.), a cementing action in the acid that will not decompose the tooth structure, because so in harmony with the phosphates of the teeth.

Its acid affinities become balanced in the zinc oxide, which renders the cement almost if not quite insoluble in the fluids of the oral cavity.

The addition of some other ingredients as an alkali or neutral salt may be of some use in overcoming the deliquescent tendency, and may have a mechanical use in filling the pores of the cement and thus avoid a tendency to contract in crystallizing.

In applying the cement to the cavity of the tooth, the more perfectly the process of crystallization takes place before being exposed to the action of the fluids of the mouth, the more enduring it will become. It may be used in the teeth of very young children, where the cavities cannot be properly prepared with retaining points or undercuts, because it adheres to the walls of the cavities as it adheres to the vitrified surface of the porcelain slab on which it is prepared. It has a decided tendency to adhere to the instruments while packing it in the cavity; which may be prevented by the moistening of the instrument with some of the fluid acid, placed near by for that purpose. Oil has been recommended, but it will prevent the cohesion of any further addition of the material, but fluid acid will not.

Cement fillings are not permanent in character; but under favorable circumstances they will stand from two to six years; so that they subserve a useful purpose.

When we can compound a cement that will remain as unchanging

as gold, as enduring as porcelain, as adhesive as oxychloride of zinc, as much in harmony with tooth structure as oxyphosphate, of the color of tooth structure, and last but not least, as impervious to moisture, and of the same expansion and contraction under thermal changes as tooth structure, then we shall have the ideal cement that shall displace the elaborate fillings that are now the pride of the profession.

NATURE OF GROWTH, AND HYPEROSTOSIS.

DR. W. H. ATKINSON, NEW YORK.

What is the first body that we can see? It is a granule. No man can see a molecule. No amplification of power of any microscope that has yet been discovered has been able to get at it. I call it an ideal body, and the statements are made merely as crutches to help our minds to grasp the perception of what afterward becomes competent to be perceived by our senses. I will try to say something that will at least find lodgment in your minds enough to inspire you with a desire to know, so that you may make investigations. As to the doctrine. The doctrine that was pronounced as settled is not settled at all. It is a mere hypothesis and an assumption, and that is what has ailed us all the way through; that we assumed a knowledge we did not have, and set forth as ex-cathedra, and required men to subscribe to it or be put out of the synagogue. "The Lord is in His holy temple; let all the people keep silence before Him," was said of the Elohim of the Hebrews long ago. Since that we have ceased to follow immediate leaders, and we have had our leaders back in the same class with only one single term ahead. The assumption that hyperostosis, or abnormal growths of tooth cement, occurs in utero and during the development of the teeth with living pulps is an assumption, and not proved. I do not think it ever will be proved. There are too many circumstances that indicate to us that this deflection of the store of radiancy was not potentially resident in the tooth-germ, so that by possibility all the nutriment or new impact of energy that would stop the deflection would get increased deposits of, first, protoplasm, and then embryonal corpuscles, and then the cementoblasts, and then deposit the lime-salts, to make it hard enough to hold it, so that it could be cut and made visible in the section we have. The very fact of roots of teeth having ten to twelve or fifteen distinct laminæ of cement-corpuscles laid on them, and obliterating all the intervening spaces that were once traversing the alveoli, and fusing with the adjoining tooth, as I have seen five teeth right along, all extracted in one solid phalanx,—to say that they could have occurred before the teeth were erupted is

contradicted by the line on which we find them standing. If I have had a glimpse of the law, it is want of use that raises the mischief among us always, of rheumatism, gout, tumor, cancer. It is the lack of the togetherness of use that induces the impact. Energy is expended on the function of the tooth in occluding against the other one, and does not order the deposit of the lime-salts that are in the neighborhood, so as to encroach on the socket and at last unite with the other tooth adjoining it. You will find that the so-called peridental membrane leads us a great way into trouble. Every membrane has a basis of connective-tissue corpuscles as its stratification or foundation-stone, and when they tell me that you must save the periosteum if you expect to get reproduction of bone, they are in fault. It is not the periosteum that is the bone-producer; it is the substratum of osteoblasts that lie immediately between the periosteum and the formed bone to which we must look as the immediate antecedent of the production of the bone or the cementum. We need in our intellectual growth to do as we do in our bodily growth. We need to take the breath in, steal out of it that which we need, and expel and not take in that breath again. We never do take any of these steps twice. We cannot by any possibility do it mentally or bodily. But to carry us to the point where we get the conception of how the so-called forces are differentiated into the bringing-up of the five tissues constituting the body, and how they are maintained during the lifetime of the possessor of the tissues, is what we desire to get at. I have tried to follow the line in my own mind, but as I say it was a miscalculation to make a deduction, and it ought not to be presented in a paper where there are men who are less endowed with the understanding of the subject than the man who reads the paper and makes the investigation. Whether he reads it originally as his production or that of somebody else does not matter so much; but if you knew how my protoplasm boils when I see men using other men's ideas and not being quite full in their apprehension and acknowledgment, you know if I *could* fight, that is when I *would* fight; but it is not contention that we need, but emulation,—who shall do the work best.

Then I would not have so much of this brush in the way to cut, before I could get at the point that would enable you to get the conception of these tissues, that comes from an endowment which is entirely beyond the range of sense. No man knows why. I do not know the why of anything. We ask how it is. That is what the microscope can reveal, but when does it reveal it? After the work is done. After the man is dead they will cut him up and tell what ailed him. They don't know what ailed him. They have simply the tracks that the ghost left, and they describe that as disease. These are pro-

visions of this little embodiment of energy to maintain their possession as long as possible, as each one of us tries to maintain his possession as long as possible, and however retiring and sylph-like he may be, you put him far enough to the corner, and he will fight like a cat for his individuality. These fellows are doing this very thing by building so much of this pericementum here as to make a mass that was called exostosis. We say arsenic caused the mischief, when it was the energy that lay behind the arsenic that caused the mischief, and the arsenic was the vehicle. Arsenic as a metal, has no affinity for any of the tissues, and it must be oxidized or have some agent in contact with it that changes it from a metal to a salt, and then, when that molecule is broken up by reason of the pabulum in the tissue having a greater affinity for the oxygen (that is made oxide of arsenic) than the arsenic has for it, an unmarrying and disruption of the molecules take place, and that is where the poisoning comes in. All the salts hold the same law. All the ashes hold the same law. Ashes are the product of burnt metals. This is the divine word of truth and soberness, if you will only allow your minds to be so set on it till you can catch the stored radiancy and store it to be useful to you afterward. The law of nutrition begins on the same principles. It has the type behind it. That type is the mode of storing radiance, and that gives us variety of the inhabitants of the planets, and that is the point they have been dealing with. We know the Darwinians and the evolutionists have been trying to find out how they could distinguish between species and variety and genus; it was this inherited past molecular experience of ancestral activities that had been stored in the protoplasm, from which the new germ was produced, from which the body, teeth and all, comes out by the expression of the re-awakened energies.

I offer a Delmonico dinner and a pair of clean sheets at my own house, and a week's lodging, for a specimen of hyperostosis, or so-called pericementosis, on a tooth that has never lost its occlusion. Thumb-suckers and mouth-breathers are the people who have these troubles.—*Am. Dental Association.*

EXPERT TESTIMONY.

Judge C. C. Fuller, of Mecosta county, in the case of "State of Michigan *vs.* Vanimmans," decided, when a physician refused to testify on the ground that the evidence would be expert testimony, "After many years' study and observation, I decide that a physician's knowledge is his stock in trade, his capital, and we have no more right to take it without extra compensation than we have to take provisions from a grocery, without pay, to feed the jury. The court rules that the witness is not compelled to testify.—*Southern Clinic.*"

WAS IT HONORABLE?

We see in the proceedings of the Lake Erie Association an item for friend Harland to explain. It seems that in the *Dental Review* the following "query" was published:

"To the Editor of the *Dental Review*, Sir:—I wish some advice about the treatment of the antrum. I have a case where an abscess from the second bicuspid discharged with the antrum, and after the extraction of the root, pus continued to flow from the opening. What treatment should be adopted? D. D. S., Meadville, Pa." Some uncomplimentary comments were made that a D. D. S., should be so ignorant.

Now there happens to be but one D. D. S. in Meadville, Cyrus See, D. D. S., an estimable dentist. Dr. See stated to the society that he wrote Dr. Harland asking him to name his correspondent, if the communication was genuine; if not, that is, if it was made up in the editor's office merely to have a text to write from, that he would so state in the next *Dental Review*. Dr. See says a reply was received stating that the "communication" was not genuine, but that the editor declined to make any amends.

Dr. See asked that a committee of three be appointed to examine the the publication and the correspondence between himself and Dr. A. W. Harland, the editor, on the subject, this committee to report by resolution or otherwise, as the question demands.

On motion of Dr. Heivly the president appointed Drs. Wolfe, Magill and Todd as said committee, who reported:

We, your committee appointed to take into consideration the matter complained of by our fellow member, Cyrus See, D. D. S., of the publication in the *Dental Review*, in Vol. 1, No. 3, Page 165, and signed D. D. S., Meadville, Pa., find it was not a communication from any one, but originated in the office of the *Dental Review*. We find the matter complained of, from the evidence presented, to be true; and therefore, we wish to offer the following:

WHEREAS, Dr. See feels aggrieved by said publication and has written to the editor of the said journal, and the reply received from said editor is of so evasive and unsatisfactory a nature, that we deem it but justice to Dr. See and the profession at large, that the facts in this case be made public. Therefore,

Resolved, That the publication of the query in question was an act unprofessional toward a brother dentist, and beneath the dignity of respectable journalism, and that the secretary furnish a copy of this report to the dental journals for publieation.

E. M. WOLFE,
D. D. MAGILL, } Com.
J. A. TODD,

We shall be pleased to publish Dr. Harland's explanation.

TEETH WITH DEAD PULPS.

DR. JOHN G. HARPER, ST. LOUIS.

The treatment advised by Drs. Mills and Newkirk in the March and May ITEMS will soon be obsolete, at least I hope we may all live to see that day.

Teeth with dead pulps may safely be treated and filled at *one sitting*, provided there is not too much inflammation.

If there is a fistula, treat as follows: Wash out all pus and remains of the pulp with peroxide of hydrogen, forcing the peroxide through the fistula, and keep this up till it ceases to bubble; then wash out with bichloride of mercury 1 gr. to the ℥ of water, thoroughly dry by washing with alcohol, evaporate this with hot air, finally force carbolic acid through the tooth and fistula, wipe out all the carbolic acid from the tooth and root canal; now the root canal is ready to be filled, no further treatment being required.

If there is no fistula, treat as above, being careful not to force any septic matter through the apical foramen, and fill at once, if there is no inflammation to prevent. I have been following this practice for nearly three years with good success, only one case gave any after trouble and that subsided in forty-eight hours, without treatment.

To illustrate, I will give my experience with two upper incisors in the same mouth, the teeth had been filled at quite an early age, perhaps fifteen years; the patient, a lady, being about twenty-five when I filled the teeth in September, 1884. I had wedged the teeth apart, anticipating to remove the defective fillings and fill the teeth. After removing the fillings, I proceeded to prepare the cavity, but found the teeth void of sensibility, leaving that peculiar appearance belonging to a tooth with a dead pulp, I excavated until the pulp chamber was penetrated, and found the chamber filled with a soft offensive mass. I treated the tooth as indicated above. On the following day treated the other incisor, found the pulp canal filled with pus when opened. Both of these teeth gave no trouble after filling.

If there is inflammation, paint the gums with chloroform, tincture of aconite and tincture of iodine equal parts, and direct the patient to return in three or four days, when the chances are that the tooth may be filled.

Should any trouble follow the above treatment, make an opening through the gum to the apex of the root and treat through that.

To Destroy Pulps.—Dr. C. J. Tibbet's says the following is better than the ordinary paste: 12 grs. caustic potash; 10 grs. very finely powdered arsenic, with water enough to make into a paste, now add 10 grs. crystals of cocaine.

THE FORMATION, CIRCULATION, AND LIFE OF A TOOTH.

DR. A. H. THOMPSON, TOPEKA.

The power by which the movement of fluids in the protoplasm of the tissues is maintained is the function of osmosis, inherent in protoplasm. On this depends the flow of the fluids which create and continue life in all animal organisms,—even that highest elaboration of protoplasm called man. For, after all, animal forms are but modified sponges, which draw fluids through the meshes of their tissues to strain out the nutritive substances contained therein and casting their waste products into the stream, allow it to pass on.

It is through this faculty of osmosis inherent in all tissues that continuous currents are maintained. This is illustrated by the known example of the animal diaphragm separating two dissimilar fluids which variably commingle through this membrane. The membrane by a power all its own, a capillary affinity, draws the fluid within itself. That is called *end*osmosis. Then by another action—repulsion—it sends the fluid onward and outward—expels it. That is *ex*osmosis.—If now we carry this conception to the living membranes and tissues within the body, we will observe that they too possess this power of osmosis; that they absorb fluids—pabulum—from the capillaries by an attraction,—an affinity,—and then expel them by a repulsion equally strong, thus maintaining the currents. The change of polarity of the fluid must take place within the tissue to account for the sudden switching from attraction to repulsion.

Probably the hunger of the tissue for food causes it to draw the pabulum, and having absorbed the nutriment it craved and thrown the waste into the current, the fluid becomes repellent, and it is expelled with equal force, thus maintaining a vacuum and acting with the precision of the positive and negative poles of the magnet. This power of attraction and repulsion must vary with the vitality and density of tissues, of course. Thus, the nervous substance being more vital and vascular would require and attract more nutriment and throw out more waste, and we find this to be a physiological fact; and bone being less vital and more dense in structure would atrract less nutrition and throw out less waste. By the power of osmosis the circulation of the blood and other fluids of the body is aided and accelerated, and that the attraction and repulsion so exercised on the body by the tissues is the missing link in the chain of causes inducing the movement of the blood in its circuit.

We cannot but conclude that this function is present in all tissues; that it is one of the inherent properties of protoplasm and of all its compounds. We know, indeed, that all tissues are nourished by the circulation; we know that they throw their effete matter into the veins,

to be carried off; we know that all compounds of protoplasm possess the power of osmosis; we know that protoplasm is the basis of all tissue, and hence conclude that this element has most, if not all, to do with the osmotic nutrition of the tissues.

And so, as there is living substance within the tissues of the teeth, and that this must be protoplasm or its simple protean compounds, we assume that the dental tissues are nourished by the ever-present and ever-acting powers of osmosis. We know that osmosis, of course, begins at the capillary walls, the limit of the red blood-corpuscle's excursions, and that the pabulum is carried by that power to the innermost parts of the tissues, and that waste is carried back to the sewage system of the economy. We know also that this osmotic circulation is maintained within the bones, by which the currents flow through the protean contents of the canals and their connections, and the bone thereby nourished and molecular changes effected even in its calcific substance. We know also that this circulation is maintained in the fibrils of the dentinal tubes, and that life is thereby sustained in the dentine. As the tubes anastomose with the canaliculi of the cement at the periphery of the dentine, and the circulation is continuous between the two tissues, we depend on this circulation for the maintenance of life sufficient for the toleration of the tooth by the living tissues about it after the removal of the life-source of the dentine, the pulp. We expect it to preserve not only the life of the cement intact, but also to maintain some vitality in the dentine in contact with it.

But further than this, it has been conclusively demonstrated that there are areas of living substance in the enamel, and that this living substance is in direct connection by an anastomosis variably regular and continuous with the contents of the dentinal tubes. If this be true, then indeed there is osmosis by which nutrition is conveyed to the enamel, however minute and inappreciable it may be.

If this circulation exists by the inherent powers of osmosis in the protoplasm or protean organic elements of the dental tissues, then we must hold that molecular change is possible within limits that could make such change appreciable. If the tissues can be fed and their waste products carried off by this osmosis, then must molecular change be possible in the dental tissues as in other tissues, through physiological variations within health-limits; but especially in favorable pathological canditions of the circulating fluids would these tissues be subject to alterations.

There are ordinary evidences of this modification. First, it is well known that the teeth at eruption are not so dense in structure, so rich in inorganic elements, as as maturity. Again, this density usually increases with age and active employment, so that the dentine of old

age and the dentine of adolescence are very different in quality. The former is nearly devoid of protoplasm, and the very fibrils become calcified to some extent, and often the pulp itself; while the latter, though morphologically perfect, is very incomplete chemically, and possesses a large quantity of mere protoplasm, which will need to be calcified before the dental tissues will reach their mature texture.

And if this calcification can take place after the tooth is erupted and morphologically complete, we must believe from analogy that the polarity can be reversed and *de*-calcification be possible under the incitement of pathological conditions. Even physiological change of the circulating fluids, such, for instance, as occurs in pregnancy, induced perhaps by lime-starvation, may cause molecular change, for we have reasons for believing that lime is taken from the teeth and bones for the construction of the osseous system of the fetus, and that it is returned after this function is completed. Indeed, the molecular disturbance of the entire system is very great and appreciable, physiological activity everywhere being accelerated during the continuance of the creative function. And after this, during lactation, there is also disturbance of a somewhat different kind, a lactic prevalence and a draining of the system of its general food stores when the required lactic elements are not supplied by the digestive and assimilative powers in sufficient quantity to meet the excessive demand. In both conditions a molecular breaking down occurs, and the resulting food is appropriated by the growing child.

Again, we know that the teeth of patients which have been in good, dense condition for years, requiring very little treatment at our hands, will suddenly, and often without apparent cause, take on a condition of unaccountable softening, and caries will progress with uncontrollable rapidity. What it is that causes this remarkable change, what it is that acts through the circulating fluids to disintegrate and carry off the lime-salts, we do not know. But it is a molecular change of some sort,—a retrograde metamorphosis which simulates a return to the embryonic condition,—a breaking up of molecules for *re*-formation of elements which may have a destiny as food to other parts of the system, or it may be to form purely waste products.—*Trans. Am. Den. Ass'n.*

Why and how all the forms of all the tissues in all their multifarious qualities and compositions should assume special shapes and characteristics and powers under the impulses conveyed by the minute cells which are the foundation of the organism, we cannot understand, unless, indeed, we fall back on the interference of a supernatural power above and beyond our ken.—*A. H. Thompson, Topeka.*

DO YOU KNOW HOW TO TALK.

"A white and red calf" means one calf, but "a white and a red calf" means two calves. There is a wide difference between ability and capacity. Capacity is the power of acquiring knowledge, but ability is the power of applying it to practical purposes. "I found the way easy," and "I found the way easily," convey different ideas. In speaking of a look of illness on a person's countenance, the correct form is, "He looks bad," not "badly." The young lady may look "bewitchingly" at the gentlemen, but she looks "bewitching" in her silks and jewels. Aggravate is frequently misused. An offense may be aggravated, but a person is provoked, irritated, or angered. Alike is often incorrectly coupled with both. "They are both just alike," is as incorrect as the Hibernicism, "I saw it with both my two eyes." A disease spreads "over all" the country, not "all over" the country.

There is difference between bravery and courage. Bravery is not courage, but courage is calculating and cautious. Bravery may be blind, but courage advances with its eyes wide open. Bring, fetch and carry are too often used indiscriminately. To bring is to convey to or toward; to fetch is to go and bring, which involves two journeys; to carry is to convey away or off, and opposed to both fetch and bring. The superfluous use of but is a common error. "There is no doubt but Guiteau is guilty," should read "no doubt," etc. Calculate is sometimes vulgarly used for intend, purpose, expect; as, "He calculates to go to-morrow." Instead of "Let you and I go," say "you and me." "He is as good as me;" "as I." Instead of "Who do you mean," say "whom." For "If I was him," say "If I were he." "Who do you take it to be," should be, "Whom do you take it be." "I am surprised at John refusing to go," should be "at John's refusing." "They prevented him going forward," ought to be, "prevented his going forward."

There is a nice distinction between answer and reply. We answer a question or a letter, but we reply to an argument or accusation. Lovers of big words sometimes say anticipate instead of expect. Now we may expect a visit from burglars, but we do not anticipate them unless we take measures to frustrate their designs. Any should not be used in place of at all. It should be "She is not at all better," not "any" better.

At all, as an intensive phrase, is too frequently used. Sometimes it gives emphasis, but generally it is mere tautology. At length should not usurp the place of at last. "At length we heard from him," should be "At last we heard from him." At length means fully, in detail. Balance is erroneously used for rest or remainder. "He used the rest of his money to improve his farm," not "the balance."

Between is often misused for among. Between is used with reference to two, and among to more than two. A man divided his property between two children; if he had more than two, it would be his duty to divide it among them.—*Artisan.*

CORRECTING IRREGULARITIES.

REMARKS BY DR. TALBOT.

Until four years ago, the mechanical forces in use in moving the natural teeth were six—the lever, the wedge, the screw, the inclined plane, the wheel, and the axle. Dr. Coffee, of England, was the first to add to the number, and the first to use piano wire in regulating the teeth. The six mechanical powers mentioned are all cumbersome. An apparatus should be small, and easily removed by the patient for cleaning. The piano wire is the best material for regulating the teeth, because the movement is uniform. There is a certain point in a spiral spring that gives a uniform pressure, and if made large enough will produce uniform pressure for twenty-four hours. You can make these springs (the Talbot spring) by driving one end into the bench, then twist the wire with a pair of pliers, giving it two or more coils or turns, as you desire a weak or strong spring. A spring can be worn a week without change of tension, and one spring answers for many cases. I make two small plates of rubber along each side of the jaw, and then, after a little study as to the best place, I bore holes in the plates, to receive the prong ends of the wire spring. Always drill the holes in such a position that the plates will not fly away from the teeth. In making the plates, cut the plaster cast so that the prongs of the plates pass between the teeth and help hold the plates in position. Another way is to make a band of thin platina around the teeth, bore holes to receive the springs, and spring into place. If the holes are deep enough, the force of the spring will hold the plates in place. To move teeth on only one side, make a plate large enough to take in one side, and then make a smaller plate for the side to be moved. The cause of the increasing number of cases of irregularity is the premature extraction of the temporary teeth. A case where the temporary teeth were extracted on one side of the jaw caused a marked deformity. There is no deformity on the other side, where the teeth were allowed to remain till ready to be shed. I believe it to necessary to preserve and retain the temporary teeth. I have noticed where the temporary molars have been extracted very early the permanent molar pushed forward, and did not leave room for the eruption of the cuspid, the follicle of the cuspid being further up.—*Ohio Dental Journal.*

CAPSICUM.

Though somewhat neglected this is an important remedy. It has no superior as a safe and effective general stimulant. It increases the secretion of the salivary glands, promotes the formation of gastric juice, and increases the secretion of the intestinal glandular system. It accelerates the heart's action, increases arterial tension, and produces a feeling of warmth and well-being throughout the entire system. It increases the urinary and cutaneous secretions, and acts as a stimulant to the organs of reproduction. It is invaluable in the treatment of atonic dyspepsia, and in the apepsia of chronic alcoholism. It is the most efficient agent that can be used to overcome the craving for alcohol in dipsomnia. It is also useful in the treatment of the opium habit. Incipient delerium tremens may be prevented, and a pronounced attack aborted, by the administration every hour of half-dram doses of the tincture of capsicum, or from twenty to forty grains of the powder. Gastralgia, enteralgia, and flatulent colic may be readily relieved by a few five minim doses of the tincture. Capsicum is effective in the treatment of flatulent dyspepsia, hysterical flatulence, and the tympanites of typhoid fever. It is also valuable in the latter disease, and n typhus and other low forms of fever as a general nervous and cardiac stimulant. It is one of the most potent remedies that we possess for cholera morbus, cholera infantum, and Asiatic cholera. Diarrhea and dysentery, especially when due to the presence of fermentative material in the alimentary canal, may be quickly checked by large doses of capsicum. It will also be found of benefit in chronic malaria. It is more effective than any other remedy in the treatment of the esthenic types of scarlet fever, diptheria, smallpox, and other zymotic diseases. In tesis, leucemia, anemia, and chlorosis, it stimulates the appetite, promotes digestion, and increases the activity of the blood producing organs. It is also valuable in the treatment of amenorrhea of thin, pale, or nervous subjects. In these the tincture should be given in five-minim doses three times a day for a week before the time at which the menses are expected to appear.

Capsicum is invaluable in the treatment of functional impotence, and the impotence of nervous subjects. It is also of service in spermatorrea, prostatorrhea, leuchorrhea, and chronic cystitis. It may be added with advantage to the various expectorant mixtures employed in chronic bronchitis. It is also serviceable in chronic constipation, and in the treatment of hemorrhoids when due to a relaxed condition of the rectal mucous membrane. A gargle composed of one dram of the tincture of capsicum, two drams of salt, and half a pint of water will be found beneficial in chronic pharyngitis, relaxation of the uvula, and in hoarseness due to a relaxed condition of the vocal chords.

External applications of capsicum are valuable in the treatment of hysterical paralysis, lumbago, chronic rheumatism, torticolis, neuralgia, and stomachic and intestinal colic. The tincture is an excellent application to indolent ulcers and unbroken chilblains. — *Cincinnati Lancet-Clinic.*

RECUPERATIVE POWER OF A TOOTH.

PROF. C. N. PEIRCE, PHILADELPHIA, IN FIRST DIS. DEN. SOCIETY, N. Y.

That a tooth is a living organ with vital functions does not admit of a doubt. That its vitality is of a degree sufficient to preserve such an interchange of materials between itself and its environment as will serve to maintain its chemical and structural integrity, is not so well established.

In certain structures the life and nutrition of the tissues which constitute a complex organ may, in a limited sense, be distinct from that of the organism of which the structures form a part, but so closely allied are they to it and its nutritional changes that the organ cannot be considered as a unit or as having an independent existence.

The activities of the organism are accomplished at the expense of nutrition, and the retrograde metamorphosis as well as the nutrition of individual tissues, or parts of tissues, is at the expense of the potential energy stored up from the assimilation of materials obtained from food. The activity of the glands, the respiratory movements, the heart's action, emotion, volition, and thought, are all directly at the cost of certain constituents of the various tissues concerned. In other words, work means waste, and the measure of the activity of any living mechanism is to be found in its excretions or discarded products. Tissue waste, however, is not necessarily commensurate with the material at the same time assimilated by any given tissue; it may be more or less. This relation between receipt of nutritive material by the organism and its appropriation at special localities is physiological order. Depletion as a sequence of abnormal systemic disturbance results in enfeeblement of the vital functions; hence local denutrition. Each organ, like the entire organism, is wasted in performing its functions, and has to restore itself from the material it draws from the common fund. If, then, the pabulum furnished by the organism be deficient, the individual tissue or organ suffers; but if sufficient, or in excess, it will, under ordinary circumstances, maintain its integrity. In other words, anything that enfeebles the organism or modifies its vital functions disturbs the distribution of the nutritive material which is demanded either in the growth or in the maintenance of the organ's integrity. A further nutritional requirement is, that the pabulum furnished must contain those substances which are demanded for the

recuperation of special organs, however much they may differ from other and contiguous tissues. That these conditions may all be fulfilled, and that each organ or locality be supplied with nutrition in proportion to its needs, the central nervous or regulating system must be able to exercise its functions in a normal manner.

These aphorisms, if applicable to other structures, represent also the facts regarding the teeth and tooth-tissues.

Assuming your familiarity with tooth-development, let us consider the facts named in their relation to the recuperative powers of the tooth. We are taught that the processes of nutrition are localized in cells; that the cell alone is the essentially vital structure; and some biologists even limit vital activity to certain parts of the cell, mainly the nucleus, which they regard not only as the chief agent in the reproduction of the cell, but in its nutrition also; the periphery or outlying portions consisting largely of formed material in which nutritive changes have ceased. It is, nevertheless, through changes in this formed material that the function of the tissue is accomplished, and a tooth considered as a unit furnishes in the location, structure, and wear of its enamel a most excellent example of waste in exercise of function. In a certain sense the enamel is dead, holding no resemblance to the living formative protoplasm from which it was derived, but playing an important though purely mechanical part in the life-history of the tooth, whose nutritive and vital processes are carried on in other parts or structures. We have in the tooth also a good illustration that in nourishment and restoration only certain portions of tissue have the power of reproducing out of pabulum, while other parts serve simply a mechanical purpose, giving form and durability to the organ or structures.

For the reproductive and recuperative processes of the tooth we must look elsewhere than to the dense, resisting and protective coronal covering, which holds much the same relation to the other tooth-tissues in its purposes as does the periphery of the cell to its nucleus, or the heart of the oak to its surrounding structures, which with it make up the massive trunk.

The dentine, a tissue of which the human tooth is largely composed, we find differently organized, and though originating from tissue not greatly unlike that of the enamel-germ, it is in location and function distinctly different from enamel. Its vital activities give evidence of a connection with the arterial and nervous system, which renders it subject to modifications through the general or systemic nutritive processes. Less dense in structure than enamel, dentine contains a much larger proportion of organic material (the enamel of the adult tooth containing probably less than two per cent.) The dentine is permeated by tubes, and, if we accept Prof. Heitzmann's

teachings, also a network of protoplasm, which necessarily greatly exalts its capacity for vital changes.

The third dense tissue of the tooth, cement, in its origin, its capacity for nutritional changes, and in density, is closely allied to the dentine, though differing from it in its methods of blood-distribution and the conditions which are dependent on an increased supply of nutritive fluid. Notwithstanding the presence of this large per cent of organic substance (dentine 28 per cent, and cement 30), with increased nutrition and sensation, both the cement and dentine in a normal condition is colorless, demonstrating that their nourishment must be derived entirely from the plasma of the blood, which differs from the hematoplasts, or red corpuscles, in coloring material and chemical composition. The fats, phosphates, potassium salts and iron predominate in the latter, while the plasma contains the chlorides and sodium salts.

A condition patent to every observing practitioner of dentistry is the modification, if not the complete arrest, of the progress of caries which so frequently accompanies the patient's approach to maturity. This fact, which is usually given as one of the evidences of the recuperative power of the tooth, is supposed to be a necessary result of an apparent increased density of tooth-tissue, because these conditions are so almost universally recognized at the same time. This increased density, however, by some of our histologists, is claimed to be an assumption; but the former statement regarding the occurrence of a period when there is a partial, and in many cases a complete, arrest of the progress of caries, is too fully substantiated to admit of a doubt. The error, oft repeated, is that this improved condition of the tooth-structure is itself an important factor in tooth-salvation, *while the truth is it is only a concomitant, and due to improved systemic conditions.*

Admitting without argument this asserted increased density of tooth-tissue, let us consider other reasons for this modification of the progress of caries. The period of life when this most frequently occurs is at a time when the systemic demand for the mineral salts is somewhat abated by the completion of the osseous structures, so that, without any material change in the quality or quantity of the food consumed, there would be in the nutritive supply a surplus of the phosphates, chlorides, and sodium, which would naturally and unavoidably throw into the secretions an additional supply of these mineral products. The immediate local effect of these salts in the oral secretions would be to neutralize acids arising from food-fermentation, as well as to cause deposits on the necks of some of the teeth, especially the inferior incisors. This accumulation on the teeth is an intelligible explanation of the natural or unaided arrest of dental caries.

The presence of salivary calculus, due to a general or systemic cause, is indicative of the demand and supply resulting from a previous or present vital activity, and *gives local and positive evidence that the systemic conditions are not only favorable to tooth-presservation, but also to solidification of dentine and pulp-calcification.* To the several forms of secondary dentine styled osteo-dentine, dentine of repair, and dentine excrescence or nodular dentine, may also be added dental exostosis, excementosis, or hyperostosis, as my friend Dr. Abbott styles it. These are forms of hypernutrition with which you are already familiar. Some of these, though pathological in their influence, are nevertheless considered evidences of a recuperative power of the special tooth-tissue, and while developed in response to local excitation, their presence is dependent on certain systemic conditions.

A recognition of this recuperative effort of the tooth should save the careful dentist from many an error, and enable him to treat to a satisfactory termination abnormal conditions and accidents which are of frequent occurrence. This recuperative power should be recognized as an aid in the conservative treatment of exposed pulps, in the union of fractured roots, and as a factor in the processes by which relief from pain is secured when thermal changes are acutely recognized from the conductivity of a metal filling.

Good illustrations of this recuperative power are also to be seen in some teeth exhibited with pulps thoroughly calcified, and in which acute sensibility was maintained till their extraction; also, in this model of a right superior incisor which was treated by my friend Dr. Pike, of Philadelphia, exhibiting the reunion of an oblique fracture, which had occurred across the root, the result of a blow. The coronal point of the fracture was at the palatine margin of the gum.*

As already stated, the relation between receipt of nutritive material organism and its appropriation at certain localities is physiological order. So, enfeeblement of the vital functions from systemic disturbances results in denutrition. The latter condition is not less an evidence of vital activity than the former, though the retrograde metamorphosis is usually styled pathological. In illustration of this law we have an interesting experience. A young lady (age, temperament, etc., not essential to the fact) was decidedly anemic; the central incisors were filled in superficial cavities, mesial surfaces; teeth subsequently became responsive to thermal changes. This condition continued with slight but annoying increase of pain for two years, for the last few months at times being almost unbearable, from which relief

* The union of fracture in the exhibited tooth was complete; the course of the original break was distinctly seen, as much so as in the reunion of a broken bone.—ED. ITEMS.

was temporarily obtained by large doses of quinine. The fillings were finally removed, and the pulps in both teeth were found to be fully exposed, with the pulp-chamber in the crowns much exceeding the normal size. The pulps were devitalized and removed, and the canals and crown cavities filled in the usual manner, resulting in an entire cessation of the pain. Had the receipt of nutritive material by the organism and its appropriation by the teeth been normal, the result would have been a deposition of dentine of repair and a diminution of the pulp-chambers probably continuing till their final obliteration in the crowns. The result, as it was, evidenced vital energy, and, had the demand of the locality been sustained by the organism, a different termination would have been chronicled.

DISCUSSION.

Dr. W. H. Atkinson. I am happy to have lived to hear such a paper read before a dental society. But there is an impression on my mind that there are few who care even to follow the basal principles on which our daily practice depends. This subject lies at the foundation of correct practice. It is but tentative; it it not pronounced doctrine. It is not proved, but is cognate with my experience. It is similar to a case which I have detailed to you, that of B. C. Bent, the cornetist, whose incisors were fractured by a blow from a cricket ball. I secured them in place, and they returned to a healthy condition. The pinkish appearance of the cruorine, that appearance seen in persons who have been over-treated with arsenic, and the fact that the teeth became firm again in the sockets, proves that there is recuperative power in a tooth. And it is not in the pericemental membrane, but it is at that locality. It is in the plasma. All nutrition takes place in fluids. The talk of nutritional change occurring in solids is the sheerest babble. Professor Heitzmann is the man who led us in the way to apprehend what we are talking about. I refer to the reactive power that is manifested after deterioration of tissue; that it must revert to the embryonic condition by a process that goes down the ladder a few steps, bringing the tissue into that plastic condition where it is ready to receive the solution of lime and the chlorides and the phosphate of soda, potash and magnesia, so that they can build, by an effort of crystallization, the structure in a hardened and hypertrophied condition, and in an increased size. Those teeth in B. C. Bent's mouth are remarkable; we can count on always having as good success as was obtained in that case. The plasma of the constitution has more to do with it than we have been willing to acknowledge. The ripening and churning of the digestory process that converts the food into plasma, so that the systemic powers can take hold of and convert it into protoplasm, embryonal corpuscles

and the tissues belonging to the part, is too fine a point for lazy minds to grasp.

This is an auspicious night for such a discussion as this, because we have a kindred subject on the programme—that of implantation—which involves nearly the same principles. As a body we are not sufficiently erudite to talk about it except on a surface view.—*Cosmos.*

IMPLANTATION.

DR. TENISON IN FIRST DISTRICT DENTAL SOCIETY OF N. Y.

The lady, a private patient of mine, had worn for fifteen years a plate to support a single right superior central. I had almost persuaded her before Dr. Younger's arrival in New York to allow me to supply the loss by implanting a tooth; but when I learned that Dr. Younger was here I requested him to perform the operation. I hunted through the city for a suitable tooth, and finally succeeded in finding in the office of Dr. Hess a number of teeth, which he kindly gave me. Dr. Younger met the patient at my office in the morning of the day of the special clinic, October 15th, and he then, without administering an anesthetic, performed the operation of implanting the superior right central. The lady bore up admirably under it. The tooth was ligated by Dr. Younger and the lady dismissed. The next morning I found a slight puffiness of the lip, and very slight swelling of the face, but no other bad results. A few days afterward when I saw her again the swelling had disappeared. There was a little soreness, but she was quite comfortable; and about a week after the operation the tooth was firm. It stood a little in front of the other central, and Dr. Younger, who was present at the time, removed the ligatures and put on others, to bring the tooth into better position. Last evening to my great surprise, I received a letter from the lady, stating that on Sunday the ligatures had come off and the tooth was so loose that she could move it with her lip. I immediately telegraphed her to be at my office this morning at nine o'clock. I had previously taken an impression of the mouth in English impression material. After sending the despatch I went into my laboratory and made a celluloid plate, with a button, or raised portion, behind the tooth. At nine o'clock this morning the patient was in my office, but to my gratification I found the tooth was firm in the jaw, and in good position. It had been without ligatures since Sunday, and it projected slightly. I put the plate I had made into the mouth, brought the tooth into position, and tied it to it. The tooth is resting against the plate, and is firmly ligatured to it. The lady was overjoyed to find everything was in such good condition. The gums were looking well. There was no inflammation about them; and, as

far as I can judge, the operation is a success. The color of the implanted tooth is entirely different from what it was when first placed in her mouth. It is now almost a *fac simile* of her own teeth in color.

Dr. T. B. Welch: How long had the tooth that was implanted been extracted?

Dr. Tenison: I cannot tell you. It had been extracted some time. I do not imagine that there is any bony union at present. The tooth was pretty well covered with pericementum when it was implanted. I asked Dr. Younger how much of the root he had imbedded in the jaw, and I understood him to say about one-third. Then I asked the question whether he expected there would be any bony deposit around it toward the margin the gum. He said there would be about one-third more on the labial surface and about three-fourths on the palatal surface, and that, together with the union of the gum, there would be perfect solidity of the tooth again. I cannot say anything more about this operation till time shall have demonstrated its success or failure. So far it appears to be a success.—*Cosmos*.

ADDING PORCELAIN TO A BROKEN TOOTH.

EDITOR ITEMS:—A few weeks since a miss, aged 10, had the misfortune to break off her upper right central about midway, leaving the pulp protruding. A few days after the accident I removed the nerve, prepared the canal, squared the broken end of the tooth, drilled two small holes, *one* each side of the nerve canal, fitted a thin piece of platina accurately to the end, made three holes through it corresponding to the openings in the tooth, took two foot-shaped pins such as are used in White's teeth, and a piece of platina wire pivot, and I inserted the three in the plate, allowing the center piece to go well up into the canal and projecting to nearly the cutting edge of natural tooth. This center pin was flattened at the lower end. An impression was taken with the small piece of platina and three pivots in position, and the piece soldered with gold foil. One of Dr. Land's enamel fronts was selected, cut in two laterally, the cutting edge fitted, and some of Dr. Land's gum body added. It was then baked in Land's gas furnace and cemented in place. It is now giving good satisfaction. The platina between the joints was cut back a little in front so the porcelain tip could be fitted to the broken part accurately. Unless closely examined there is nothing to indicate that a dental operation has been performed.

D. V. BEACOCK.

A dentist is not justified in extracting an incisor or a cuspid which may happen to stand out of line, because it can be done at an insignificant expense, when to bring it into line would be more tedious and expensive.

OXYGEN AS A THERAPEUTIC AGENT.

H. B. LATHROP, M.D., LOS ANGELES, CALIFORNIA.

The sources from which oxygen may be derived are many and too well known to need enumeration here. The decomposition of chlorate of potash by heat furnishes perhaps the purest gas with the least apparatus.

Within the last five years the Messrs. Brim, of New York, have perfected an apparatus by which a very pure gas is obtained, at a minimum cost, by the successive peroxidation and deoxidation of caustic barytis. Air is forced into retorts containing the chemical and heated to about 800 degrees Fahrenheit. The oxygen contained in the air heated at once combines with the barytis (peroxidation) and is as quickly sucked up by a powerful air-pump (deoxidation). The gas thus obtained is for sale in receivers under pressure, pure, or mixt in any dilution with air or other gas ordered. It is also forced into water and sold in the same way as carbonic acid or other mineral waters are. This water has been used successfully as a dressing for wounds. It is probably a superoxide of hydrogen.

The physiological effects of pure oxygen inhaled are as follows: The respiration is gradually lowered and deepened, so that it is nothing uncommon for a patient who has become accustomed to the gas to unconsciously reduce his respirations to seven or eight per minute. The pulse is also slightly slowed and rendered fuller. There is a general sense of comfort, and sometimes there is a slight feeling of dizziness. It seems to be thought by writers that the inspiration of pure oxygen predisposes to neumonia. I have therefore always used the gas diluted, and am sure that no such result has ever followed. The mixture I employ is about one volume of oxygen to three of air. This I mix in a proper receiver under about eighty pounds pressure to the square inch. I believe that this compression renders the oxogen contained in even the ordinary air *active*. For if oxygen liquefies under a pressure of 600 atmospheres it must receive some alteration from six.

The known antiseptic value of oxygen has been so highly spoken of that some one has gone so far as to say that the activity of *all* antiseptics is due to their oxygen. Dr. William, in a highly interesting paper read before the Franklin County (New York) Medical Society, details Pasteur's interesting experiments with the bacillius of hog cholera. He, and after him Day and Law, showed that these germs could not long exist in air impregnated thoroughly with oxygen.

Interesting researches have been made as to the presence or absence of disease germs in waters of known depth, inquirers finding that as the depth increased the bacteria diminished. They think that

this pressure releases oxygen from the water, and that as such it acts directly on any bacilli the water may contain, oxidizing them and rendering them inert.

I have myself nearly filled a stout syphon bottle with stinking urine, and then connecting it with an air-pump forced in oxygen under sixty odd pounds pressure. In a short time the fetor has left the urine, and in the bottom of the bottle is a stratum of something that I think, if I may coin a term, is a new oxide—the oxide of bacteria. Oxygen is a little heavier than the air, therefore air containing it in excess permeates the air cells of the lung more thoroughly than other air. Oxygen is also elastic. The compression it has received has more closely compressed the molecules, and the moment the pressure is withdrawn they are separated and diffused more thoroughly.

Can oxygen *cure* tesis? I can only answer that I am not sure, but I think it *can;* because it *does* destroy germs and fungi of all kinds. It *does* enrich the blood. It *does* furnish to the system a greater quantity of the vivifying principal with less respiratory movement than does the air we breath, and *if properly diluted* is *absolutely* non-irritant. Its action must appear plain.

The action of pure oxygen gas in the treatment of post-nasal catarrh and ozena has in my hands proved particularly happy. Fetor has been removed almost directly, and *never* returned. The discharges from the naso-pharynx have rapidly grown less, and in almost every case where treatment was persued for three months a cure has been apparently effected. The subjoined case is an illustration:

P. F., age 13—Hypo-trophic Catarrh. By that I mean the mucus membrane lining the posterior nares and covering the turbinated bones was thickened and reduplicated, affording an immense secreting surface. The discharges, both anterior and posterior, were most offensive. He commenced treatment on Feb., 17, 1885; on the following day the discharge was matereally lessoned; on the 28th the fetor had departed and respiration was free and natural. On March 1st his parents state that he sleeps with his mouth shut, which he has not done for years. The treatment was continued till June 1st, when, his parents removing to the upper country, he was lost sight of. In February of the present year, however, I find that his parents have been living in Oregon, in the interior, but that no symptoms of catarrh have manifested themselves since his removal from this place.

Such is the history of two other cases.

The great difficulty that all physicians find in treating catarrh is, that patients will not take either the time or the money to continue treatment till cured. I think oxygen applied directly to the diseased surfaces, thus improving their nutrition, and following the law of gas endosmoses and penetrating congested venous capillaries, predisposes to rapid resolution of the inflammation and its consequent cure.

Asthma also requires a momentary consideration.

Oxygen in my hands has been useful only under pressure of an atmosphere and a half. The patient is placed in an air-tight cabinet and oxygen pumped in till the pressure-gauge attached to it shows twenty-two pounds to the square inch. We now have an instantaneous relief, which lasts some days. I have some doubts in my mind as to whether this does not result, at any rate partially, from the carbonic oxide that must be formed from the air expelled from the lungs of the patient during the operation. Of course this must be small, because after a few minutes the relative quantity of carbonic acid expired must become small in proportion to the amount of oxygen that is being pumped in.

The apparatus I use to make my oxygen consists of a copper retort, a large wash bottle, and some rubber bags to hold the gas. The retort is filled, or nearly so, with chlorate of potash and manganic oxide, in the proportion of one of the manganic oxide to three of the chlorate. An alcohol lamp is all that is needed to heat the chemicals, and the retort being connected with a five-gallon bag, the evolution of gas begins and soon fills it. A little practice is necessary in producing the gas so as to avoid accidents. The bag being full, I now connect the nozzle with a force pump and force the gas into a steel receiver, tested to stand an air pressure of 100 pounds to the square inch. Having raised the pressure in this to a given number of pounds, I can draw off any number of pounds that I may require. This I can pass into another receiver, where I pump in a certain number of pounds of pure air, thus effecting any dilution I may wish for any special case. For the treatment of catarrh I simply use distilled water, through which I pass a current of perfectly pure oxygen by means of spray tubes of various makes and shapes. The water washes diseased surfaces as it goes, and the gas—both contained in the water, and free—finds itself in direct and fresh contact with the cleansed surface.

—*S. Cal. Practitioner.*

A simple and quick way to make solid grinding surfaces for bridge or crown work, is as follows: procure a natural tooth corresponding to the tooth to be made; lay a piece of cuttle-fish bone on the bench soft side up, and then press the occluding surface of the natural tooth into the soft cuttle fish bone; on removing the tooth a perfect impression will be left in the soft bone. Now melt some scraps of gold and while fluid pour into the impression and press the gold while soft into place with a smooth flat instrument, the result will be a perfect copy of the natural tooth. This is the way jewelers cast gold ornaments.

Ontario, Cal. E. N. HAMILTON.

ASSOCIATION WORK.

PROF. J. TAFT, CINCINNATI.

[Read before the Ohio State Dental Society.]

By this means knowledge has been increased and methods of demonstration by clinics have been utilized, to the benefit of multitudes. For the introduction and practical use of dental societies, the profession is chiefly indebted to Dr. W. H. Atkinson, who, with a prophetic eye, in 1859, foresaw the possibilities of associated work in our specialty. In these associations, men have learned the strong points of their fellows, and the weak points of themselves; these lessons are valuable. The strength and attainments of others may by right means become our own, and we may minister to others, and our feebleness be converted into power. The societies have done much in molding the character of the profession by benefiting those actively engaged, and they have made a marked impression on those entering its ranks. The time has passed when a young man can enter an office and complete his course of instruction in from three to twelve months and go out with an endorsement by his preceptor, as entirely competent to discharge the varied and difficult duties of the dental surgeon. The power of these associations has made a good impression on our special institutions of learning. It has obliged them to take higher ground and advanced positions.

The possibility of regulating the practice of dentistry by legal enactments was, till a comparatively recent period, entertained by few; but, as it came to be discussed and studied, it received more favorable consideration, till now almost every State in the Union, has a law regulating the practice of dentistry, and one of our Territories also has a society and a law similar to those of the States. Our societies have also exercised a healthy stimulus on our literature; for many have thus been induced to write, who otherwise would have done little in this direction.

Every district having ten reputable dentists should have its organization embracing towns within convenient distances. The society of each State should meet annually, those of the cities, monthly, and those of the smaller towns and districts, as often as convenience warrants. The work that may be done by each of these classes will necessarily differ in some respects, in others there will be work common to all. The American Association is a delegated body whose members come from all other organizations of our profession in the country, so far as they wish to be represented, and this is almost universal. This is not a legislative body, further than its own affairs are concerned, notwithstanding it has an interest in, and should exert a wholesome corrective

and stimulating influence on, all other societies, particularly those represented. This fostering care was exercised more in the early periods of the society than in later years, it seemed then to recognize much more fully the importance of this work than now. For several years it had a committee whose duty it was to aid in the organization of local societies, and doing whatever was practicable in the way of aiding those already organized. A report was made by that committee on the state of the Association and the condition of the profession generally. While the presentation and the discussion of modes of practice, and the details pertaining to it are interesting and valuable, would it not be better for us to give more attention to the general interests of the profession, than we have been disposed to do for some years past? The great moving and controlling influences that are operative in the profession, should certainly come within the purview of our state bodies; and though they are not invested with legislative power, yet, in an advisory way, they may serve well the interests of the profession, in some respects directly, and in others indirectly, but resulting in good. The dental profession of Great Britain is outstripping us in some respects; there the law regulating the practice, involving registration and all the details of its requirements, is a unit, uniform in action and results. There, the profession is brought to a uniform standard of requirements, registration is universal; violaters of the law are punished. In this country perhaps it is not possible to attain the same uniformity in respect to requirements and law, as in England. Each State enacts its own law, and adopts such requirements as it may see fit, and many of those laws are defective. May not the American Association exercise a wholsome influence over the various State societies here represented, in bringing about a more uniform standard of requirements, and making registration requisite to every State? It certainly is within the province of this body, to labor to this end, thus tending to elevate the standard of professional attainments, and producing uniformity in all the great interests of the profession. Declarations have been made in reference to our modes of education, which has made a good impression. All societies and institutions should feel entirely at liberty to ask advice and direction.

The time and work of our State Society should be given, more to the broad interests of our profession, and less to practical detail. Our State societies can well afford to foster those of more local character; every State should look well to the execution of its State Law. There are also certain aspects of the educational problem which they may well consider. It is desirable that all State and local societies should consider well the subject of pupilage. The qualifications and character of those entering our profession, is an important question, which the

societies can reach efficiently. They can decide as to the qualifications of those whom the members will encourage to become students. No one, now-a-days, who thinks of entering the profession, will attempt to enter on a course without consulting some one whom he regards as competent to give advice, and in a majority of instances such persons interested, are members of some dental society. By establishing a standard, and adhering to it, great good would be accomplished.

A very small proportion of the profession is embraced in our dental societies. Laboring to build up the membership in every one, would be productive of great good. Instead of there being but 2,500 members of the profession in our societies, there should be from eight to ten thousand. Two-thirds to three-fourths of all our societies could be instrumental each year, in bringing in from one to three new members, by well directed effort. Why shall this not be done? Every State society should become incorporated. To be an incorporated body is very easy; for this, the common law makes ample provision. Another direction in which effort may be made, where a society always meets in one locality, is the establishment of a library and apparatus. This would constitute a nucleus producing permanency and stability, and would be of great value and benefit. In such a museum, specimens and appliances would find a safe place for the information of the members. Very few in our profession have access to more than a small number of our standard works. The establishment of a museum and library would be an element of strength.

There are really four classes of societies: the National, the State, the District and the City, each having some distinctive work. The chief value of the National society is the unifying influence which it exercises over all bodies represented in it, and in fostering association work generally.

In regard to State societies, the question of a fixt habitation is one worthy of consideration.

City or mere local bodies will find much to occupy the attention that would not be practicable in those of a more migratory character; thus it would appear that each class of associations has a distinctive form of work, to which special attention should be given, and which if well done would yield greater results than have yet been realized.—*Ohio State Journal.*

Strange that so many warnings are unheeded. A minister in Bridgeton, N. J., has been mastered by the chloral habit, and compelled to resign his charge. He says a physician recommended it to him, but it so gained the mastery over him as to affect his actions. Such things always will; even quinine has ruined some men, and tobacco its thousands. Whoever makes "a new necessity for himself is not wise."

RUNYAN'S METHOD OF BRIDGE-WORK.

DR. H. W. RUNYAN, EATON, OHIO.

There is no doubt that bridge-work is valuable in many instances for partial dentures. But the great cost of the gold process places it within the reach of comparatively few, while there are fewer practitioners of dentistry that thoroughly understand the swaging and soldering of gold that is necessary in the construction of the gold bridge-work. The method here described will place it within the reach of all who can afford a plate of any kind, and it can be constructed by any one capable of making a vulcanite plate, and I think it will last as long as any of the bridge-work, or as long as the roots, to which it is attached, will last.

PROCESS OF CONSTRUCTION: For a case where the four incisors are missing and the cuspid roots remain:—

After cutting the cuspids down to, or a little above, the margin of the gum, prepare by drilling out the canal with an inverted cone bur, and then a pointed fissure bur. By so doing, a perfect funnel-shaped canal is formed, which gives strength to the work and facilitates access to the end of the root. Take a platinum bar long enough to reach from one root to another, and bend at right angles to form the pins. Now set the bridge support in place, after bending to conform with the gum; and take the impression and articulation. Make the model, place on the articulator and wax on vulcanite teeth. Remove from the articulator, flask and vulcanize, after covering all the rubber with vulcanizable gold.

Gum teeth can be used for the bridge between the roots, if the alveolar process has been absorbed very much.

After vulcanizing, clean up and fasten in by placing a little cement on the pin that extends into the cavity formed by the fissure drill. The rubber will fill that part formed by the inverted cone.

Use the best rubber, run the vulcanizer up slowly to 300° Fah., and vulcanize for one hour and fifteen minutes. You will have "a thing of beauty, and a joy" to your patient and yourself.—*Ohio Journal of Dental Science.*

Partial impressions should be well flooded with water just before the plaster is poured. The plaster should be mixt considerably thicker than usual, as the water left in the impression will mix with it and render it thinner. After the impressions of the teeth are filled, pieces of wire may be dropt into them to strengthen them. A cast from a well-drenched impression will show but few, if any, air bubbles, as the water leads the plaster over the surfaces and into the depressions.—*Dr. J. D. Wingate.*

CURE OF ALVEOLAR ABSCESS BY GUTTA PERCHA.

DR. D. R. JENNINGS.

You must always remember that in this treatment, like all others, to arrive at success you must be very thorough, leaving nothing to *luck*. You will remember also, that there can be no alveolar abscess unless there is absorption of the alveolus, and that this absorption makes a cavity, and that cavity must be disposed of to effect a cure. My plan of procedure in such cases is: As soon as there is an abscess formed you will find, if you extract the tooth, that the root of the tooth has become denuded of its periosteum where the sac is attached. The objective point is to get rid of the abscess and restore to a healthy condition.

After trying all the remedies recommended by others and having many failures, I tried the plan of filling the whole of the abscess cavity and root canal with a solution of gutta percha in chloroform. To make this, take a portion of base plate gutta percha; cut it into small pieces and put into a bottle containing chloroform, enough to make a paste of the consistency of thin cream. Clean the pulp chamber, root canal, and abscess cavity thoroughly—exhausting all the pus from the sac at and around the roots—wash with alcohol and water equal parts, or with peroxide of hydrogen; dry as well as you can. Then with one of Donaldson's little bristles, made for cleansing root canals, with cotton fibers wrapt around it, dip into the gutta percha solution and introduce into the pulp chamber and roots, using the cotton wrapt broach as a piston to pump the solution through the root canal into the cavity of the abscess, continuing to force the solution through the root till it makes its appearance at the sinus opening. If it is found coming too freely, lay the finger on the opening, thus causing the solution to be forced into any and every place around the root where the sac is, in this manner strangulating it and preventing the gathering of lymph to be subsequently decomposed into pus. The abscess is thus destroyed. The gutta percha being an inert substance, becomes encysted, nature thus assisted goes on and closes up the sinus; and you will have no more fear than if there had never been an abscess. It has one more recommendation, to the patient at least; it is painless. I have pursued this course of treatment since 1879, and as far as I know, have not had a failure. I do not say that there has not been one; for they will not always come home to roost however much we may wish them to.—*Dental Register*.

The Emperor of Austria has smoked twenty cigars a day. Facial neuralgia has made his life miserable, and a council of physicians has instructed him to stop smoking if he wants to be rid of it.

CAPPING PULPS.

EDITOR ITEMS:—Would you, or some of your numerous readers, inform me if I am right in using carbolized paper for pulp capping? I find it so convenient that I am anxious to know if there is any danger in using it on account of paper being a vegetable compound and consequently subject to decay.

My mode is to cut a piece of common note paper to the desired size, saturate it thoroughly with carbolic acid, and with a little gum Sandarac place it in position. I contend, that I then can place any of the ordinary cappings over it with less danger of pressing or injuring the pulp than I would otherwise. A. B. C.

There are various ways of doing injustice and injury to our neighbors, even without charging them with incompetency or denouncing them as charlatans. A feigned look of astonishment when scrutinizing their work, a significant shrug of the shoulder, or a disapproving shake of the head, will have the effect of undoing confidence in the operations of their former dentists, and sometimes prove even more damaging than open denunciations. To ask if the doctor was not in a hurry when he filled their teeth, if the doctor himself performed the operations, if the work was not done by his student, if the doctor's eyesight is not failing him, etc., are insinuations that excite suspicion and convey the idea that operations have been slighted. Nor does it make things smoother to add in a semi-apologetic manner that "the doctor was considered a pretty fair sort of a dentist once, but unfortunately he is getting old." This is needless and generally uncalled for. It inflicts injury on those to whom such references are made, and fills with distrust the minds of those who have received their attentions. And to sum up, no good whatever can result from such ungenerous criticisms.—*Facts.*

Implantation.—Dr. R. B. Adair says, in the *Southern Journal*:—I was escorted by Dr. McKellops to the office of Prof. Harper, who showed me one of Younger's operations of implantation he had performed a few weeks past. It was in the mouth of a young lady—first upper left bicuspid. The patient had her tooth extracted about nine years ago; the tooth implanted had been extracted six or seven years. It would take an expert to tell which tooth had been implanted; no soreness about it, perfectly firm in the socket, and perfect adhesion. She told me it never had hurt her one moment. From Prof. H.'s office we proceeded to the St. Louis Dental College, and were shown another similar operation, performed for a student by Prof. Harper, that was a perfect success, also. I do not hesitate to say now that I am prepared to believe anything possible with the dental profession.

DENTAL ANESTHESIA.

M. Georges Vian claims to have solved the problem of local anesthesia in dentistry. After numerous trials of solutions of different strengths, he has found that the soft parts about the maxille may be rendered completely insensible by the use of cocaine, associated with a two per cent solution of carbolic acid. Five minutes before operating, M. Nian dissolves five centigrams (one grain) of hydrochlorate of cocaine in fifty centigrams (ten drops) of the solution, and injects it into the gums, half-way between the neck and the extremity of the root of the tooth. Half of the solution is injected on the palatine and the remainder on the labial side, pressure being made by the finger, when the needle is withdrawn, to prevent the exit of the fluid. Anesthesia is perfect in three minutes. The quantity of cocaine advised by M. Vian seems somewhat large, but it is said to have been so used in eighty-seven cases, without causing any unpleasant symptoms.

A correspondent asks how to prevent black or other rubber from "getting up and crawling out" after packing. Soften the first pieces for packing for a few seconds on one side in chloroform and then quickly with dampened fingers or otherwise press soft side down to place, and it will stick. In packing the other pieces press so as not to stretch them. It is sometimes handy to hold a point of rubber in place by attaching a little string of rubber to it, extending the string into a surplus gutter and there fastening it with a little tack. F. A. W.

EDITOR ITEMS:—The idea of Dr. C. Thomas to make an amalgam mix from a section of an ordinary rubber ball such as children use may be convenient; but such rubber contains a large percentage of *white lead*, and other ingredients which Dr. Thomas would soon find to act injuriously in the mouth by producing lead poison. GENESE.

Baltimore, Md.

[We do not believe the "lead poison" theory should have weight. —ED. ITEMS.]

In mixing plaster of paris, if as much sugar as will lay on a silver five-cent piece is added to the water used, the cast will be found to be surprisingly hard, even if the plaster should be poor. For quick setting, both sugar and salt may be added. Slightly smearing the surface of a tooth cavity with eucalyptol will cause gutta percha to adhere firmly to the walls.—*Dr. J. D. Wingate.*

An operator has no right to cut away much sound tooth structure that he may fill a cavity so constructed in one hour, because to do it well and save such good portions of tooth might occupy three or four hours.

For Our Patients.

CLEANSE THE TEETH.

DR. WM. H. ATKINSON, IN IST, D. D. S., OF N. Y.

There is a false estimate of professional men in the community. Patients do not know what they need, and they either give professional men too much or too little confidence. If we may judge of the amount of knowledge extant on the subject of keeping the teeth in good order by the remarks and the writings that are common in the profession, the list of men who comprehend the subject at all would necessarily be very small, even though they may be dealing with it every day. It has been one of the most painful observations of my life that the men who put in beautiful fillings would send their patients away with a bill of health, while there were rings of calcareous deposit around every tooth. I have seen that not once or twice, but innumerable times, where the mouths have been pronounced to be in a healthy condition. Where is the anatomist or the pathologist who speaks about calculous deposits pressing on the gum, and thereby causing its absorption? There must be a cavity or recess in which the lime can be first deposited and retained before crystallization can take place and the deposit become solidified. The dental ligament must be first injured, and a retrograde metamorphosis or derangement of functional action ensue, so as to leave it hanging loose and forming pockets, before there can be any formation of lime around the necks of the teeth.

Always clean the teeth if they need cleaning. Where do they need cleaning? Where they are dirty. Where are they dirty? Seldom on the rotund surfaces. Generally the lips and tongue will keep those surfaces sufficiently clean. You can hardly injure the teeth by brushing if you use no powder and brush them lengthwise, not crosswise. Always brush the lower teeth up and the upper down, thus coaxing the delicate festoons of the gums to fit nicely around their necks, so that they shall lie flat and beautifully over the enamel, as the epithelium lies over the finger nails. If you tear the latter you get hang-nails, and if you tear the gums you get pockets. In the worst cases of pyorrhea alveolaris I have ever seen there was neither salivary nor sanguinary deposit, nor any deposit at all. I have seen many cases where such deposits were very rapidly laid down; but then it is soft, and a little rational brushing will take it away. We should teach our patients how to brush their teeth, and warn them against over-brushing. Some of the finest cultured people are apt to cut into the necks of the teeth on the right side by brushing backward and forward instead of up and down. I had one patient, a minister from Canada, who had cut into

the necks of his teeth by improper brushing so that there was a secondary deposit of dentine, and they began to be tender. On the other side of the mouth the destruction was not so great. He was right-handed. I have never seen teeth that were fairly organized which, if kept clean, would not remain in a good and healthy condition,—never. Wherever you have well-organized teeth and keep them free from foreign matter resting in pockets around them, so that no fermentation can take place, and there is no abnormal expression of function, you will not have decay. I have seen infants' teeth decayed when they cut through the gum. This occurs in the first place from deficiency of power to build up lime-salts. A child may have some disease that interferes with the normal expression of these parts of the system for the time being, and subsequently they succumb to attacks which would not affect well-developed organs; the lime-salts are dissolved, and we have what we call decay.

You will find that a great deal depends on how people are born and bred. We see whole families who exhibit magnificent teeth, and we say those are typical teeth, while others are miserably organized and they decay. It is not neglect of cleanliness that causes deposits of lime. Where is the proof of that? A patient has a heavy incrustation of lime on the teeth in one side of the mouth, the other side being free from it. One side of the mouth is sick, the other healthy. I can tell by looking at the mouth on which side the trouble is. The sick side is the one which shows the deposit of lime. That is the one that needs cleaning. When there is no tenderness of the teeth, you chew all around the mouth. Very fine teeth do not need any cleaning, further than nature will accomplish in the process of eating, and by the instinctive action of the tongue and lips. I am astonished to hear Dr. Abbot advocate a brush with the bristles cut straight off. I would just as lief have a stick as to have that kind of a brush. What can you do with it? It can only reach the rotund parts of the teeth. If you brush crosswise, it will spring from one rotund surface to another, and if you brush up and down it is necessarily so stiff that none of the bristles can reach the approximal surfaces. If the bristles are cut different lengths, they will find the inequalities of the teeth, if you do not brush too rapidly; brush gently, and with a slight rotary movement, so as to remove from the depressions and pockets the little deposits of substances that are likely to ferment if allowed to remain there. The "prophylactic" brush is an excellent one to accomplish this object, and I have not recommended any other brush since it was introduced. I have never sold one. I give them to my patients, so that they may be converted to the use of a really good brush. It is the good housekeepers in the mouths of our patients that keep our reputations good, and show that clean

teeth mean something. I have a lady patient who occasionally has a cavity, and why it comes I do not know. It generally develops across the teeth, between the bicuspids, and about half way from the point where the enamel knuckles together and the neck of the tooth. Right across the enamel there will be a little pit,—one of those ugly places that look as if they had been drilled out. I do not know why her teeth decay. I think, if we knew all the little circumstances that enable us to keep teath clean, and knew what cleaning teeth meant, then we would come to an understanding of how to take care of them. The doctor says use floss silk. If I had to be confined to one thing for keep- the teeth clean, either tooth-picks, brushing or anything else, I should choose floss silk.—*Cosmos*.

Life Insurance.—It is claimed that the statistics of life insurance go to show that the young man of twenty years of age, who abstains entirely from all kinds of intoxicating drinks, has a good prospect of living to be sixty-four; while the moderate drinker of twenty can only expect to live to be forty-five years old.—*Ex*.

[There is a Life Insurance Company in New York, the National Benefit Society of the City of New York, who, patterning after several companies in England insure total abstainers much lower than others.—*Ed. Items*.]

Feeding infants solid food is often the cause of indigestion that shows itself in spasms, cramps, fevers, fits, diarrhea, dysentery, etc., erroneously attributed to teething. Teething is a physiological and not a pathological process and does not give rise to the many disturbances attributed to it. There are instances of serious trouble from the emergence of the teeth, but because there is sickness during this process that is not caused by it. Look to the stomach. An emetic will sometimes relieve the most frightful symptoms and avert long sickness and perhaps death.

The mother's milk is intended for the food of babes, and should generally be the only food till the teeth come to prepare for the stomach other food; and even then great caution and discretion should be used.

When the dentists of this country discover a way to pull teeth without making a man wish he had been born a hen, life will have twice as much brightness.

Badly off.—The Savannah *Morning News* states thatEmporia, Florida, wants a shoemaker, a physician, a dentist and a blacksmith.

SIMPLE CHEMICAL EXPERIMENTS.

BLUE AND WHITE CRYSTALS.

Take ½ oz. powdered alum and ½ oz. sulphate of copper; dissolve in 1 oz. of boiling water; put into a glass tube or phial, and on cooling you will see the colorless crystals of alum are formed side by side with the blue crystals of sulphate of copper.

The famous Dr. Abernethy was one day about to perform a painful operation. As was his custom, he took care to see himself that all the required instruments were at hand, and in proper order. "I think everything is all right," said one of the assistants. "No, sir, everything is *not* all right," replied Abernethy. "Get a napkin to conceal those terrifying instruments. The poor man need not be horrified by the sight."

A woman went to a Brooklyn dentist with an aching tooth to be drawn. He told her it was badly ulcerated. "Yes, doctor," said she, "I have ulsters on all of my teeth."

A family in a Michigan town is said by a newspaper to be passing through the waters of affliction, twelve members of the family being sick with typhoid fever. It is evident that the waters of affliction are furnished by the well.—*Good Health.*

Some dentists are far too free with their gas, or other anesthetic.

IT'S OFTEN FATAL.

Full many a man, both young and old,
Is sent to his sarcophagus,
By pouring water icy cold
Adown his warm esophagus.

Press me closer, all mine own;
Warms my heart for thee alone.
Every responsive thrills,
Every caress my being fills;
Rest and peace in vain I crave,
In ecstacy I live, thy slave;
Dower'd with hope, with promise blest,
Thou dost reign upon my breast;
Closer still, for I am thine,
Burns my heart, for thou art mine;
Thou the message, I the wire,
I the furnace, thou the fire;
I the servant, thou the master—
Roaring, red hot mustard plaster.

BURDETTE.

Editorial.

PREDISPOSING CAUSES OF CARIES.

In considering the causes of caries, we should give proper weight to predisposing tendencies.

1st. The type of the teeth should be considered. We speak of the type of some individuals, as giving a predisposition to consumption, or catarrh, or rheumatism; and there are types of teeth predisposing to sensitiveness, to chalkiness, to softening, to brittleness, and in many ways to fatal attacks from outward agents. Thus we have physical idiosyncrasies of teeth as well as of the person in form, tendencies, habits and special bearings. We all recognize that the parent is the type of the child; and so we often find the peculiarities of the parents' teeth transmitted for good or for bad. How frequently we see a specific tooth partially or peculiarly developed, perhaps also its mate on the opposite side; it may be all four. If the mother is present and retains corresponding teeth, examine them and you will find the same peculiarity. If not in the mother, then in the father. Sometimes, however, it skips a generation and the parents will be reminded of "just such a peculiarity in one of the grand parents." A special tendency to some form and location of decay is also noticed in several generations.

2d. Transmitted taint has much to do in the destruction of teeth. We see this often in the development of weakness or disease of other parts of the body. Why not in the teeth? we do; and therefore speak of scrofulous teeth, syphilitic teeth, etc.

3d. Then too, the process of development has much to do with the quality of the teeth. All defects are not on the surface; internally there are often pockets, seams, fissures, brakes and other faults. They may be imperfectly nourished during development, causing general weakness against attack, or special liability to disintegration. The very process of eruption sometimes produces defects in their construction, development or constitution.

4th. A defect in the general health of the child, or attacks of special diseases during the formation of the teeth, or after their development during their growth or perfecting, has much to do with their character and durability.

5th. An unfortunate form of a tooth may predispose it to decay. Its surface may be rough and indented, with minute pockets here and there, affording deposit of decomposing matter. There may be fissures and other imperfections in the grinding surface. Examine the incisors and cuspids on their inner surface near the gum, and you will sometimes find a defective seam or deep pocket caused by the imperfect fold-

ing of the enamel, often overlooked, which predisposes to caries; such forms of the teeth which bring their proximal surfaces in contact all the way from the grinding or cutting surface to the gum, frequently favor decay. One author says: "The broad triangular spaces intervening at the necks of the teeth, which furnish deposits for foreign matter, is a prolific proximal cause of tooth decay." But we think this the best possible form of the teeth to *prevent* decay, as they afford self cleansing spaces.

6th. Disease, even at mature age, may be a proximal cause of caries, by weakening the resisting power of the teeth to disintegrating agents. We are apt to keep in mind only the vitiated condition of the fluids of the mouth during the disease; but though we may not be able to remedy the tendency to tooth decay through a general diseased condition of the body, we are obliged to recognize it as a factor.

THE COST OF DENTAL WORK

The complaint that dental work costs too much is not well founded. It should be borne in mind that professional work is necessarily unsteady—that is, much time is generally unemployed; therefore, when it is brought into requisition it should pay better than labor which is remunerative every hour in the day and every day in the year. Besides, many businesses may be made profitable in proportion to the capital and to subordinates employed; but in professional labor nearly all remuneration is the result of the skilled labor of the one man. The work cannot be entrusted to subordinates, nor the profits be increased by capital. Then, again, all works of skill and taste require precise knowledge, long experience and dexterous manipulation, that should bear a price in proportion not only to the time employed on an individual piece of work, but also in proportion to the time required to attain the requisite knowledge and skill. A surgeon will sometimes richly earn in thirty minutes what an unskilled laborer will be thirty days in earning. A physician will make out a prescription in five minutes that has taken five years to qualify himself to prepare. To one complaining that $500 was extravagant for a picture that had taken but two months to execute, the painter replied: "Do you say I have been but two months in bringing this painting to perfection? Sir, I have been a lifetime."

So in the profession of dentistry; years must be spent in attaining the knowledge and skill necessary to treat the various diseases of the teeth and mouth wisely, and to permanently restore to usefulness teeth that have become partially destroyed; or, where they are entirely destroyed, to substitute new dentures that will speak and laugh, and work like the original. A gold filling, artistically and thoroughly perfected,

is a continual satisfaction, while one clumsily and imperfectly done is a vexation and often a loss. Gold skilfully packt in a tooth is nearly as solid as coin, requiring to be drilled or cut away to be removed. A whole tooth of gold, therefore, may be built on a firm root, with the assurance that it will be durable. But, of course, to attain so much skill requires time, patience and adaptation to the work. So in the construction of artificial dentures. There must be a general expression of the face in size, shape, complexion and position. There must be a free and youthful play of features, a clear and natural intonation of the voice, an ease of mastication, and a general sense of comfort. A set of artificial teeth are worth everything, or they are worth nothing.

LITERARY STYLE.

This phrase seems to be sometimes misunderstood. A dentist who frequently appears in our journal, and who has literary ability, writes us concerning our practice of condensing articles, thus:

"I like to see you do it with what most everybody else has written, but not my own; and I presume hosts of others feel the same way. There is this much true: If the article is written by some one who is not known as a writer, or a speaker before dental societies, or in any other way before reading dentists, you can cut and slash away at your will, and neither the writer or the reader will suffer. But when any one who is known writes, there are sentences put in which in no wise make an article clearer, or add to its value or contain any thought or anything else; but those very words convey the individuality of the man to me."

You smile? Well, you may; for of course this is nonsense.

A writer allows his "style" to form without thought or care, till, like a wild tree, it is without form or comliness. Useless branches and dense foliage hide the fruit, and make it inferior in quantity and quality. Then if there is an effort made toward improvement—"O, you are robbing the man of his individuality!"

There are speakers and writers whose style is the work of study, which is little better. As the book-maker would say, "It is padded." Such persons seem to think they would be giving away their fine thoughts too cheaply if they expressed them in few words. In this way they could never make great speeches or write long essays.

No wonder so many speeches in our conventions, and essays in our journals, and chapters in our books, are so full of verbiage. There is such a thing as individual style, but the use of "sentences which in no wise make the article clearer, or add to its value, or contain any thought or anything else," is a poor way of showing it.

We once accompanied a minister into the country to report his speech on temperance, for he was called a forcible speaker. Pencil in hand we listened to sentence after sentence, but could not discover any thought worth recording. For fifteen minutes it was nothing but words, words, words; and we put down our pencil in disgust. Finally, a thought was brought out; a practical, important thought, and he made it glow with eloquence.

On our way home we told him of our difficulty. "I don't wonder at it," said he. "You must look for nothing brilliant in me for the first fifteen minutes. I never calculate to say much for the first third of my discourse. I play with my audience as a kitten plays with her mouse before devouring it. Finally, you see, I get at my subject, and then I make things fly. This is my style."

How many writers thus occupy precious space, though their "first fifteen minutes" is not as interesting as the sport of a kitten with her mouse, and after that they do not "make things fly?" They may have a good thought, but to make it appreciated, it has to be picked out and said by itself.

Said a fine oritorical preacher to a class of young aspirants for orders: "Young men, in your sermons, throw away your first idle words, your excuses, and your introduction; specially have no cause for time to get warmed up to your subject. Come in your first sentence to the heart of your theme. Strike it so squarely it will make the fire fly; let it be the epitomy of your whole sermon. Then, instead of every now and then wandering off into indefinite flights of eloquence, or dragging in anything extraneous, keep close to your text. Let every sentence be pregnant with meaning, and that meaning an inforcement of the one great thought with which you started out. That sermon will tell."

As to the importance of individual literary style, that is admitted; specially in verbal delivery, let the *man* appear. In books and current literature too much deference to this has been shown. We want thoughts, facts, substance; style must be subordinate, unless we consider terseness the hight of style. We have no space in our journal to spare for padding. Most readers have no time to read "sentences which in no wise make the article clearer, or add to its value, or conain any thought or anything else," and if they had time it would be poor employment.

Ruskin says: "Certainly it is excellent discipline for an author to feel that he must say all he has to say in the fewest possible words, or his reader is sure to skip them; and in the plainest possible words, or his reader will certainly misunderstand them. Generally, also, a downright fact may be told in a plain way; and we want downright facts at present more than anything else."

Sensitiveness of Grinding Surfaces of Teeth.—Grinding surfaces of the teeth of some are so sensitive that mastication at times is intolerable. It is generally with those past the meridian of life, caused by excessive abrasion of the enamel, or by cracks or other injury from their severe use. But it sometimes comes from their physiological condition; then complaints of this sensitiveness comes from the young as well as the old, and without reference to their abuses. A little fruit acid will "set them all on edge," or a little grit will be intolerable.

What shall be done? The teeth need shoeing. There is little else of any use. If they are persistently troublesome, shoe them, and your trouble ceases.

Many years ago some of our grinders were so sensitive that sometimes in masticating, a hard substance would set us wild with pain, as though an exposed nerve had been struck. We had the central part of their grinding surface cut back slightly, retaining undercuts worked round the edges, and these depressions filled with gold and platina alloy. Did it hurt? Yes, sir; but the result was most satisfactory. I have had no trouble with them since.

The Decay of Meat and Vegetables is caused by the combined action of heat, moisture and oxygen. By the exclusion of either of these, meat, vegetables and fruits may be preserved. Exclude heat, and you preserve them by freezing; exclude moisture (as in dried beef or apples), and you save them by dehidration; exclude air, as by canning, and you save them by excluding oxygen.

In the January number of the *Review*, Dr. Allport recommends the use of oiled writing paper, to be placed between the instrument and oxyphosphate when pressing the pellet into place. We have tried it and find it a very neat method.

Because a tooth is loose and denuded, or even painful with exudation of pus about the neck, is not a sufficient cause for extraction; a dentist now-a-day should be intelligent enough to successfully treat such teeth.

"An elegant piece of crown work" is to be commended, if too much sacrifice of healthy teeth has not been made to adjust it. Cutting off the crowns of several good teeth to secure these "bridges" are sometimes unjustifiable.

The practice of some of poorly preparing for a permanent filling because the tooth cannot last long, and will not justify an ordinary fee, is pernicious. Such ill-favored chickens sometimes come home to roost.

Labarraque's solution of hypochlorite of soda.—We again refer to this as a valuable and convenient *disinfectant.* A few drops drank in a glass of water, or the same snuffed up the nostrils in catarrh is excellent for offensive breath. When there is offensive odor from the armpits or the soles of the feet, a few drops rubbed on is an almost immediate relief. It is also a good tooth bleacher.

Phenol sodique is formed by the action of caustic soda and impure carbolic acid.

Gas Bags that have become Hard, may be made measurably pliable by immersing them in coal oil.

It is not always honorable to bow to what popular opinion requires. A conscientious dentist will sometimes do what may bring him into disfavor.

It is not allowable to immediately destroy exposed pulps, when by a little patience and intelligence they might be saved alive. If you can't do such work be honest and honorable enough to turn the patient over a dentist who can.

It is not honorable to extract a tooth simply because a patient, or a patient's guardian, demands it. He may be honestly deceived in the importance of the tooth, or, which is worse, may prefer extraction because it is cheaper. It is for the dentist to be the educator of the ignorant, and a determined opposer to the penurious.

Because a first permanent molar has an extensive cavity is no justification for its extraction. The plea that the patient, or the parent, will not bear the expense of filling is not sufficient for its loss. Nothing justifies its extraction but that it is beyond redemption.

The old and bad fashion of bevel separations of teeth should be forever discarded. Such triangular shaped openings with the base of the triangle toward the crowns is a lasting shame to the operator.

To become a successful dentist now requires a general and a professional education, and a high order of refinement, skill and adaptability.

To cause plaster to harden quickly sugar is as good as salt. It is better to increase its strength.

The New York College of Dentistry has matriculated 193 students this year.

MEETINGS OF DENTAL SOCIETIES.

Wisconsin, Milwaukee, July 19.
Missouri, Kansas City, 1st Tuesday in July.
New Jersey, Long Branch, July 20.
Pennsylvania, Cresson Springs, July 27.
Virginia, Charlottesville, July 19.

Miscellaneous.

INDUSTRIAL SCHOOLS.

A father might to-day tramp all over Chicago with a son who wanted to learn an honest trade, so as to become a useful citizen, and fail, unless he took him to the Manual Training School and paid tuition for him. Hundreds of boys are now thus taught handicraft at the expense of fathers who can afford to pay for it. But let a poor man's son try it, and he will be met at the door of the factory or shop by a walking delegate of the Knights of Labor, and turned away. If that does not do, his young face will be bruised by brutal fists, and so will the faces of those who stand by him. If any one supposes that there is any limit to this kind of opposition—any point at which the would be monopolists of labor would draw the line of limitation upon themselves—he does not understand depraved human nature. If individual liberty to acquire skill and earn bread and control earnings is not protected by law, and by resolute public sentiment behind that law, then a reign of absolute lawlessness is visible not very far distant in the future. The disbarred classes on one hand and the employing classes on the other will join hand, and fight for their rights. The violence will not long be all on one side, and the violence which has human liberty and rights back of it will win. We are always glad to see a tyrannical and heartless employer forced to do right by "organized labor," but when organized labor determines to rob the American boy of his birthright, then it is evoking moral and material forces against itself which will not fail to beat it to pieces.—*Interior.*

Force of Habit.—"There is nothing in the world that shows the inborn tendency of mankind to run in a rut more than the architecture of the modern shirt." So said a young man of iconoclastic tendencies. "For years men's vests have been buttoned almost up to the chin, and the little piece of shirt front that would be left exposed has been covered by a necktie. And yet men go on wearing shirts with fronts down to the waist starched and ironed till they are as stiff as a boiled plate, and they pay every week for getting two or three of these things carefully polished. A man might as well have the back of his vest laundried every week."

How the Government Cleans Brass.—The government method prescribed for cleaning brass, and in use at all the United States arsenals, is claimed to be the best in the world. The plan is to make a mixture of one part common nitric acid and one-half part sulphuric acid in a stone jar, having also a pail of fresh water and a box of sawdust. The articles to be treated are dipped into the acid, then removed into the water and finally rubbed with sawdust. This immediately changes them to a brilliant color. If the brass has become greasy, it is first dipped in a strong solution of potash and soda in warm water, this cuts the grease so that the acid has free power to act.

DURATION OF CONTAGION.

PEARSE gives the following conclusions:
Measles are infectious from the second day, for just three weeks.
Smallpox, from the first day, for about three weeks.
Scarlet fever, from the fourth day, for six or seven weeks.
Mumps, under three weeks.
Diphtheria, under three weeks.—*Gaillard's Med. Jour.*

The Sultan of Morocco has prohibited the sale or purchase of intoxicants of all kinds, and has abolished the State tobacco monopoly. A regular crusade against tobacco, patterned after the woman's anti-liquor crusade in Ohio, a few years ago, has been inaugurated. The Moorish tobacco and snuff shops have been closed. Large quantities of leaf tobacco have been publicly burned by the Sultan's order. Several Moors have been stripped and flogged through the streets for smoking in defiance of the Sultan's order.

The Crab has a structure analogous to the lobster, though apparently very different. Looking from above, we see only the shell; but on turning him over, we find the missing abdominal segments compressed or condensed together, and lying close up to the thorax. The crab casts his shell every year, the soft skin underneath gradually hardening into a new one. In this condition they are known as soft-shell crabs, and considered a great table delicacy.

Chloride of lime is an infallible preventive for rats, as they flee from its odor as from a pestilence. Put it about their haunts and they leave. Turpentine sprinkled about where cock-roaches or ants congregate will banish them. Moths will flee from the odor of it.

The Shrinkage of Flannel.—To keep flannels as much as possible from shrinking and felting, the following is to be recommended: Dissolve one ounce of potash in a bucket of water, and leave the fabric in it for twelve hours. Next warm the water with the fabric in it, and wash without rubbing, also draw through repeatedly. Next immerse the flannel in another liquid containing one spoonful of wheat flour to one bucket of water, and wash in a similar manner. Thus treated, the flannel becomes nice and clean, has barely shrunk, and almost not at all felted.

Ready-Made Glue.—Dissolve 1 ounce best glue in 4 ounces acetic acid; add 1 ounce glycerine and 5 drops of nitric acid. This glue keeps well and is always ready for use.

Tempering Steel.—When we were much younger than we are now, says a correspondent of the Boston *Journal of Commerce*, and the clearing on top of our head hadn't acquired such beauteous proportions, we had to temper up a lot—yea, verily, many lots—of steel tools, and here's the "great secret" we used: We got a "slush bucket" and washed it out clean, then weighed out one ounce corrosive sublimate, put in two handfuls common salt, and stirred it up with two gallons rainwater, heated the tools in hot lead, and hardened in this liquid and drew over a charcoal fire. A tool never broke.

The Barnacle, though resembling the mollusks, is properly classed as a crustacean. It has a soft body covered with a hard shell. It is provided with a set of hairy appendages, which, when all is quiet, are protruded from the mouth of the shell, and waved around in the water like an extended hand and fingers, gathering in food. This creature appears to be able to notice the approach of danger. If a person approaches a rock covered with them, he hears a slight, crackling sound, caused by the closing of hundreds of shells. The way in which they perceive the approach is not known. The backs of whales are often covered with these creatures; and it is supposed that the closing of the shells, upon the approach of the fishermen, gives warning to the animal, and enables him to avoid capture.

Ordinary Blasting Powder is made of 15 parts carbon, 20 parts sulphur, and 65 parts saltpeter.

Mixture for Cleaning Grease Spots.—Equal parts of stronger ammonia water, ether, and alcohol form a valuable cleaning compound. Pass a piece of blotting paper under the grease spot, moisten a sponge, first with water to render it "greedy," then with the mixture, and rub with it the spot. In a moment it is dissolved, saponified, and absorbed by the sponge and blotter.

Prickly Heat.—I have tried everything that a fat man suffering the tortures of sheol could think of, and got no relief until I used a two per cent aqueous solution of sulphate of copper, applied with a bit of soft sponge and allowed to dry on the skin. It dries up the eruption in from one to three days. The wash should be applied morning and night.—(*St. Louis Med. and Surg. Journal.*)

Liquid blacking, or more properly speaking the "liquid gloss," which is much used for ladies' and children's shoes, may be easily made by any one as follows: Take ivory black and molasses, of each one pound; sweet oil and sulphuric acid, of each four ounces. Rub together the first three until the oil is perfectly killed, then gradually add the sulphuric acid, diluted with three times its weight of water. Mix well and let it stand for three hours, when it may be reduced to a proper consistency with water or sour beer.

"Frog-spittle."—The frothy substance which is often found on grass, and popularly known as "frog-spittle," has no connection with that animal. It is caused by a little insect which secretes a viscid, transparent fluid, with which he is completely covered. To enable him to breathe, he reaches out a pair of legs, and, enclosing a little bubble of air, brings it down, and afterwards allow it to escape into the liquid. After awhile the numerous bubbles convert it completely into froth or a substance resembling saliva.

To kill or keep roaches away, use borax or Persian insect powder. These must be renewed frequently, as they deteriorate by exposure to the air, and lose their power.